Appendix A:

Engineering Design Documents

Lower Meadow Creek Tailings Removal

TCRA Work Plan

submitted pursuant to

Administrative Settlement and Order on Consent for Removal Actions

(CERCLA Docket No. 10-2021-0034)

Stibnite Mine Site

Stibnite, Valley County, ID

Prepared for:

U.S. Environmental Protection Agency Region 10

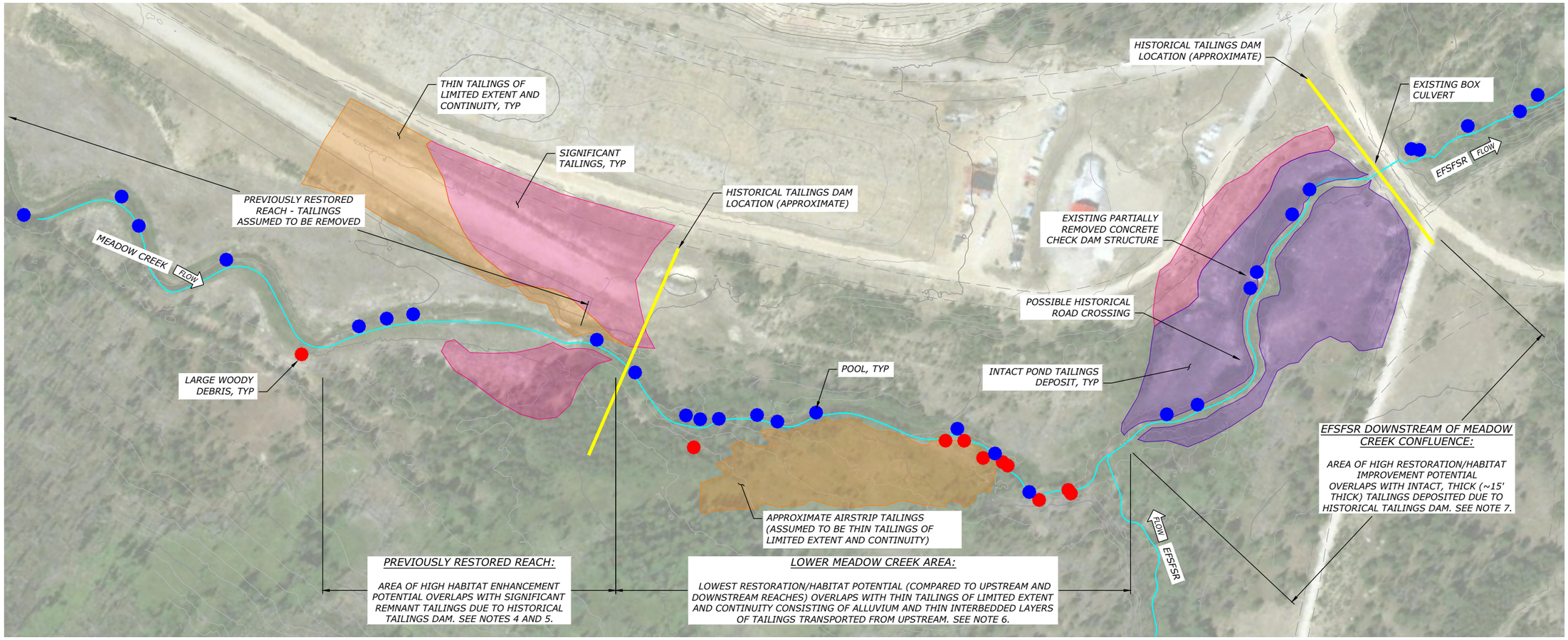
United States Department of Agriculture Forest Service Intermountain Region

Prepared by:

Perpetua Resources

405 S 8th St,
Boise, ID, 83702

July 2021



EXISTING CONDITIONS OVERVIEW

100' 50' 0 100' 200'

SCALE: 1"=100'-0"

RESTORATION OBJECTIVES:

- REMOVE 25,000 TONS (APPROXIMATELY 23,000 CUBIC YARDS) OF MINE WASTE AND INCIDENTAL MATERIAL FROM THE STREAM CHANNEL, BANKS, AND FLOODPLAIN.
- MINIMIZE IMPACTS TO THE EXISTING STREAM, RIPARIAN, AND WETLAND HABITAT.
- RESTORE THE DISTURBED CHANNEL, BANKS, AND FLOODPLAIN RESULTING FROM THE REMOVAL OF MINE WASTE AND INCIDENTAL MATERIAL.

NOTES:

1. EXTENT OF TAILINGS ARE APPROXIMATE; FUTURE FIELD INVESTIGATION IS PROPOSED TO IMPROVE ESTIMATED VERTICAL AND HORIZONTAL TAILINGS DISTRIBUTION.
2. THE TAILING EXTENTS SHOWN REPRESENT ONLY LARGE "SIGNIFICANT" DEPOSITS. FLUVIAL DEPOSITS OF TAILINGS (NOT MAPPED) LIKELY EXIST THROUGHOUT OTHER SUBREACHES WITHIN THE CHANNEL AND FLOODPLAIN. OTHER LARGE TAILING DEPOSITS MAY EXIST THAT ARE NOT KNOWN/SHOWN. FUTURE FIELD INVESTIGATIONS (INCLUDING SUBSURFACE SAMPLING) IS PROPOSED TO IMPROVE THE ESTIMATED TAILINGS DISTRIBUTION ENABLING THE REFINEMENT OF FUTURE DESIGNS.
3. EXISTING LARGE WOODY DEBRIS AND POOL LOCATIONS IDENTIFIED IN THE FIELD BY RIO ASE IN 2019. LOCATIONS ARE APPROXIMATE.
4. LOCATION OF HISTORICAL TAILINGS DAM ARE APPROXIMATE BASED ON HISTORICAL AERIAL PHOTOGRAPHY.

PREVIOUSLY RESTORED MEADOW CREEK REACH:

5. HABITAT WITHIN THIS REACH COULD BE ENHANCED THROUGH THE PLACEMENT OF LARGE WOODY DEBRIS STRUCTURES AND CHANNEL REALIGNMENT TO CREATE GREATER HYDRAULIC DIVERSITY AND FLOODPLAIN CONNECTIVITY. IT IS PRESUMED THAT TAILINGS WITHIN THE REACH WERE REMOVED AS PART OF THE PREVIOUS RESTORATION ACTIONS HOWEVER SIGNIFICANT REMNANT TAILINGS STILL EXIST WITHIN THE FLOODPLAIN AND COULD BE REMOVED IN CONJUNCTION WITH PROPOSED HABITAT ENHANCEMENT OR RESTORATION ACTIONS.

LOWER MEADOW CREEK REACH:

6. THIS REACH EXHIBITS RELATIVELY HIGH QUALITY HABITAT INCLUDING NUMEROUS POOLS AND LARGE WOODY DEBRIS AND DENSE/ROBUST RIPARIAN VEGETATION. CHANNEL FORM AND STRUCTURE ARE FUNCTIONING APPROPRIATELY (SEE REPRESENTATIVE PHOTO). AN ARMORED BED AND MATURE TREES (BOTH LIVING AND RECENTLY DEAD FROM FIRE) SUGGEST MINIMAL HISTORICAL FLUVIAL DEPOSITION HAS OCCURRED WITHIN THIS REACH. THE SMALL VOLUME OF FLUVIAL DEPOSITS ARE LIKELY DOMINATED BY BLOWOUT CREEK SEDIMENT EXPECTED TO BE MIXED WITH THIN AND DISCONTINUOUS AMOUNTS OF REMOBILIZED MINE WASTE FROM UPSTREAM TAILINGS DEPOSITS.

EFSFSR DOWNSTREAM OF MEADOW CREEK CONFLUENCE:

7. THIS REACH HAS RELATIVELY FEW POOLS PRIMARILY ASSOCIATED WITH ARTIFICIAL STRUCTURE (REMNANT DAM AND RIPRAP) AND COMPLETELY LACKS LARGE WOODY DEBRIS. RIPARIAN VEGETATION CONSISTS OF RELATIVELY SPARSE SHRUBS AND FEW TREES. THE CHANNEL FORM AND MORPHOLOGY HAVE BEEN SIMPLIFIED (I.E. STRAIGHTENED AND PLANE BED), AND THERE IS NO FLOODPLAIN CONNECTIVITY. THESE POOR HABITAT CONDITIONS ARE THE RESULT OF THE CHANNEL INCISING THROUGH TAILINGS PREVIOUSLY DEPOSITED IN A HISTORICAL TAILINGS POND AT THIS LOCATION. THE BANKS AND FLOODPLAIN IN THIS AREA HAVE LARGEST ESTIMATED VOLUME OF MINE WASTE RELATIVE TO THE OTHER SITES DESCRIBED ABOVE.

BELOW: REPRESENTATIVE PHOTO OF LOWER MEADOW CREEK AREA.

BELOW: REPRESENTATIVE PHOTO OF EFSFSR DOWNSTREAM OF MEADOW CREEK CONFLUENCE.

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WORKING DRAFT FOR REVIEW AND REVISION

STIBNITE GOLD PROJECT - ASAOC

CONCEPTUAL PROPOSED METHOD

FOR PERPETUA RESOURCES IDAHO, INC

MEADOW CREEK AND EFSFSR CONFLUENCE

VALLEY COUNTY, ID

DATE: APRIL 2021
DESIGNED: JY
APPROVED: --

DRAWING NAME

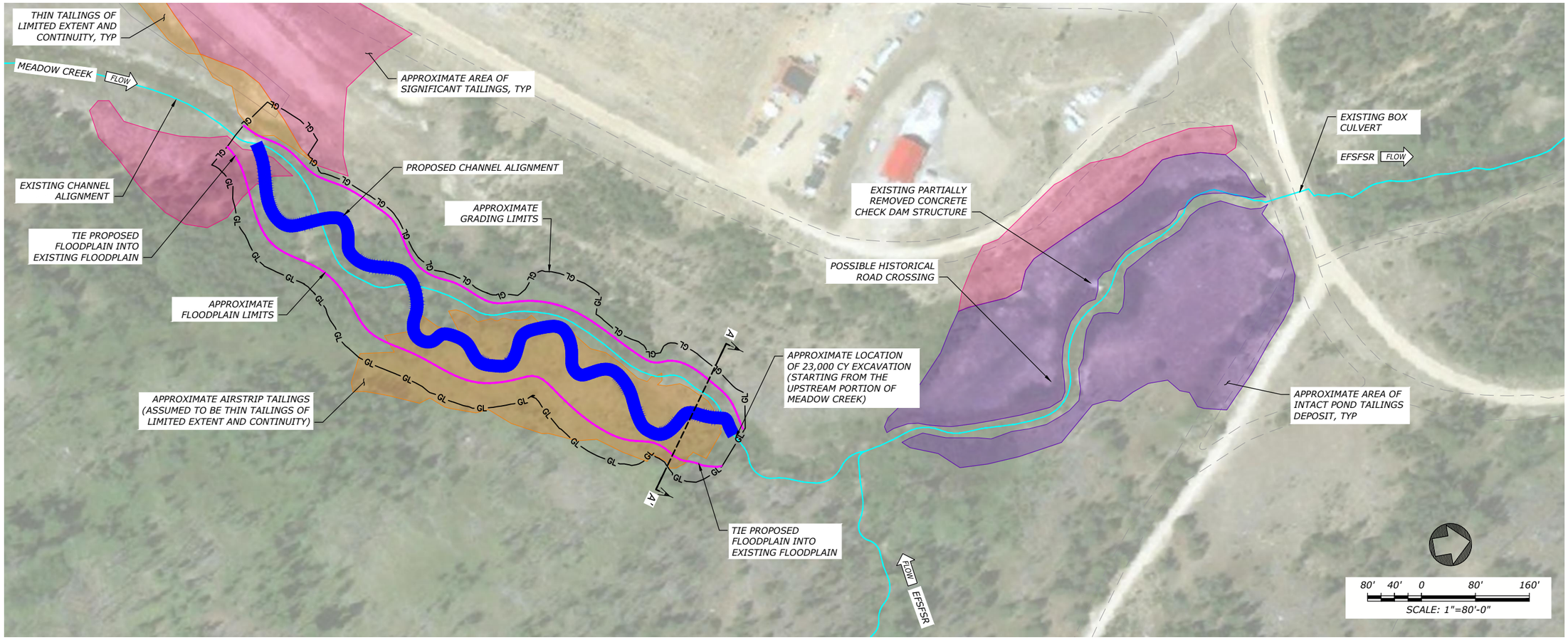
EXISTING CONDITIONS

EXISTING OVERVIEW

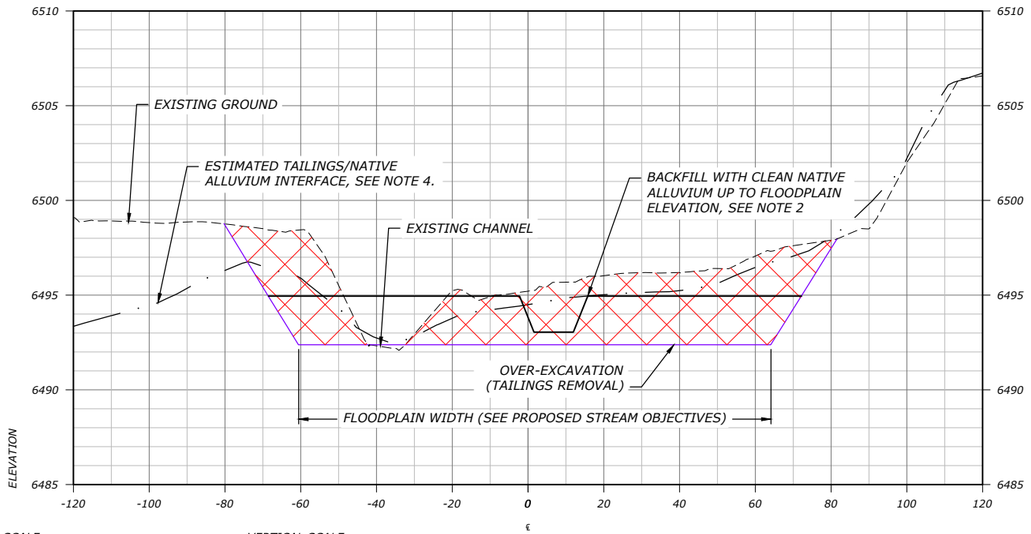
DRAWING NO.

C1

SHEET 1 OF 3



ALTERNATIVE 1



SECTION VIEW A-A'

PROPOSED STREAM OBJECTIVES					
REACH	TARGET FLOODPLAIN WIDTH (FT)	TARGET SINUOSITY	TARGET SLOPE	BANKFULL WIDTH (FT)	RIFFLE DEPTH (FT)
MEADOW CREEK	120	1.3	2.04%	18.0	1.9

TAILINGS REMOVAL SUMMARY			
REACH	EXCAVATION VOLUME (CY)	FLOODPLAIN FILL VOLUME (CY)	POOL EXCAVATION VOLUME (CY)
MEADOW CREEK (AREA AS DENOTED IN PLAN VIEW TO OBTAIN 23,000 CY EXCAVATION)	23,000 CY	9,800 CY	350 CY

NOTES:
1. EXCAVATION VOLUME ASSUMES EXCAVATING DOWN TO THE ELEVATION OF THE CHANNEL INVERT WITHIN THE PROPOSED FLOODPLAIN LIMITS AND INCLUDES 3:1 (H:V) DAYLIGHT CUT SLOPE TO EXISTING GRADES.
2. FLOODPLAIN FILL SHALL BE CLEAN ALLUVIUM MATERIAL PLACED UP TO THE PROPOSED FLOODPLAIN ELEVATION.
3. POOL EXCAVATION VOLUME IS ASSOCIATED WITH MATERIAL BELOW THE DESIGN EXCAVATION ELEVATION (EXISTING CHANNEL INVERT) AS STATED IN NOTE 1. POOL EXCAVATION VOLUME IS ASSUMED TO BE LOCATED WITHIN ONE THIRD OF THE CHANNEL AREA AND ASSUMES A DEPTH EQUAL TO AVERAGE RIFFLE DEPTH.
4. TAILINGS/NATIVE ALLUVIUM INTERFACE ESTIMATED FROM BEST AVAILABLE DATA (EXISTING BORINGS). INTERFACE MAY BE REVISED WITH ADDITIONAL FUTURE FIELD DATA.

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APPROVED: --

DRAWING NAME

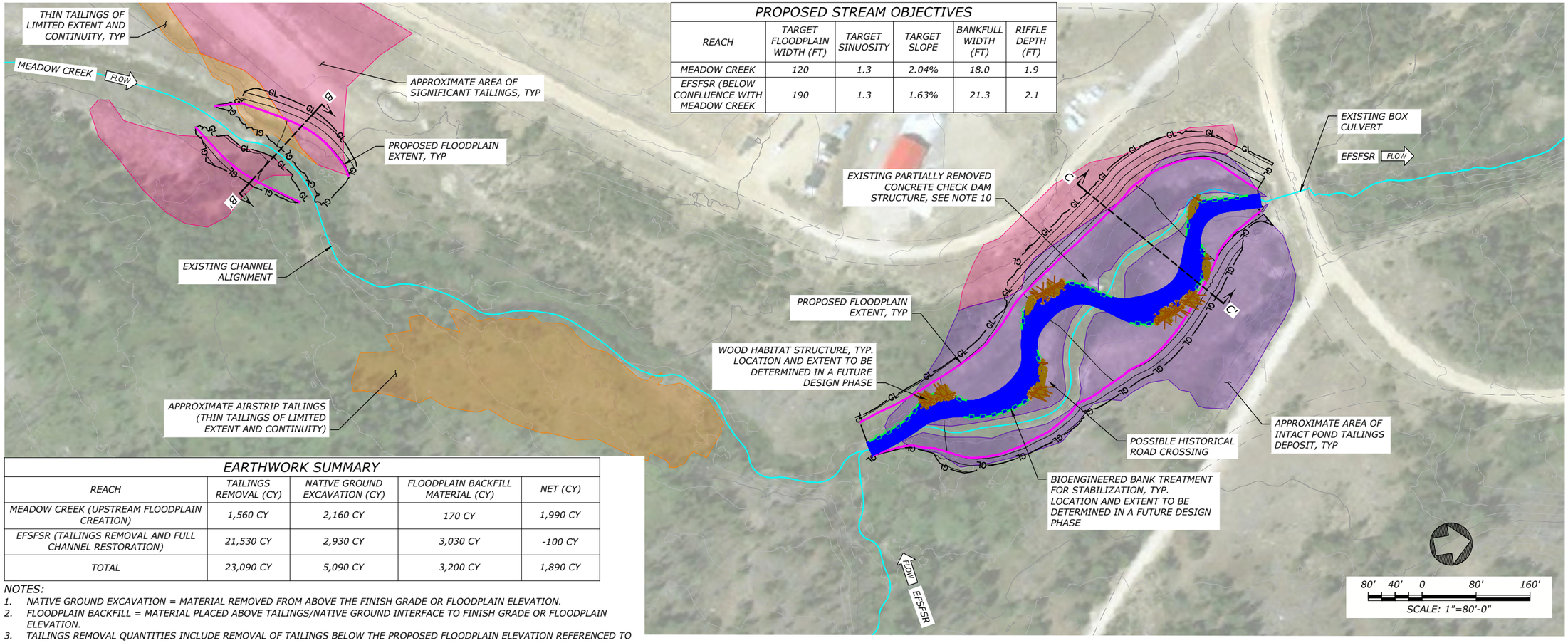
PROPOSED CONDITIONS

ALTERNATIVE 1

DRAWING NO.

C2

SHEET 2 OF 3



ALTERNATIVE 2

PROPOSED STREAM OBJECTIVES

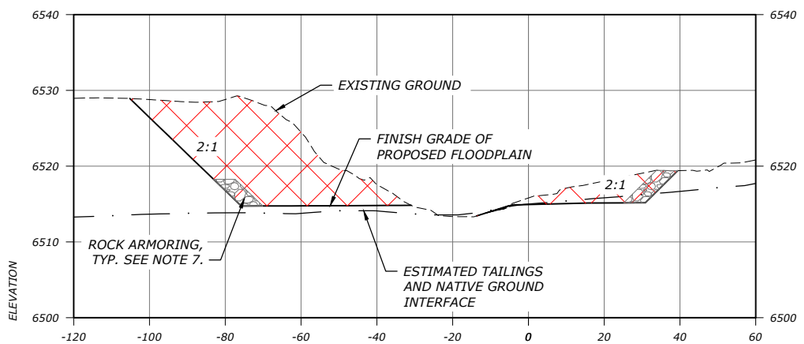
REACH	TARGET FLOODPLAIN WIDTH (FT)	TARGET SINUOSITY	TARGET SLOPE	BANKFULL WIDTH (FT)	RIFFLE DEPTH (FT)
MEADOW CREEK	120	1.3	2.04%	18.0	1.9
EFSFSR (BELOW CONFLUENCE WITH MEADOW CREEK	190	1.3	1.63%	21.3	2.1

EARTHWORK SUMMARY

REACH	TAILINGS REMOVAL (CY)	NATIVE GROUND EXCAVATION (CY)	FLOODPLAIN BACKFILL MATERIAL (CY)	NET (CY)
MEADOW CREEK (UPSTREAM FLOODPLAIN CREATION)	1,560 CY	2,160 CY	170 CY	1,990 CY
EFSFSR (TAILINGS REMOVAL AND FULL CHANNEL RESTORATION)	21,530 CY	2,930 CY	3,030 CY	-100 CY
TOTAL	23,090 CY	5,090 CY	3,200 CY	1,890 CY

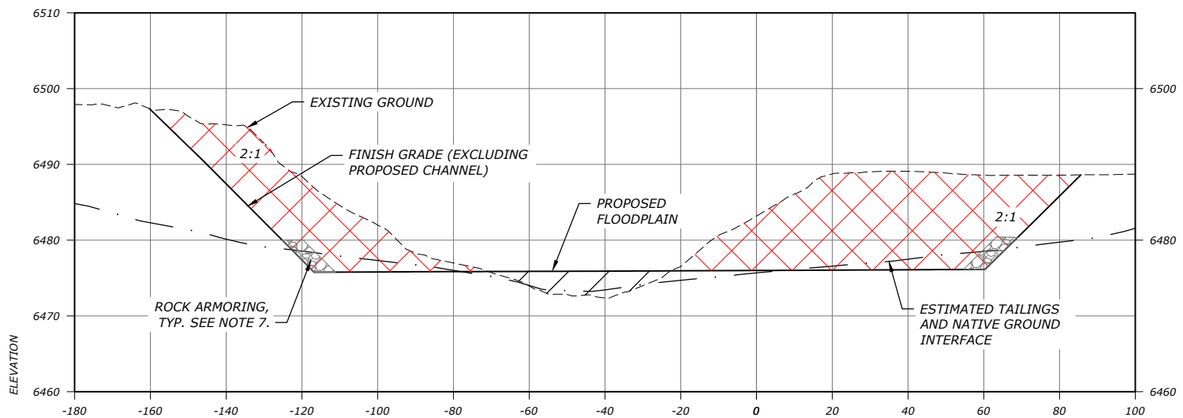
NOTES:

1. NATIVE GROUND EXCAVATION = MATERIAL REMOVED FROM ABOVE THE FINISH GRADE OR FLOODPLAIN ELEVATION.
2. FLOODPLAIN BACKFILL = MATERIAL PLACED ABOVE TAILINGS/NATIVE GROUND INTERFACE TO FINISH GRADE OR FLOODPLAIN ELEVATION.
3. TAILINGS REMOVAL QUANTITIES INCLUDE REMOVAL OF TAILINGS BELOW THE PROPOSED FLOODPLAIN ELEVATION REFERENCED TO THE ESTIMATED NATIVE GROUND ELEVATION SURFACE PROVIDED BY PERPETUA RESOURCES. DESIGN SURFACES INCLUDE 2:1 (H:V) DAYLIGHT CUT SLOPE TO EXISTING GRADES.
4. FLOODPLAIN FILL SHALL BE CLEAN ALLUVIUM MATERIAL PLACED UP TO THE PROPOSED FLOODPLAIN ELEVATION.
5. NATIVE GROUND EXCAVATION AND FLOODPLAIN BACKFILL MATERIAL QUANTITIES ASSUME EARTHWORK WILL INCLUDE CONSTRUCTION OF THE PROPOSED CHANNEL WITH BANKFULL WIDTH OF 21.3 FEET, BANKFULL DEPTH OF 2.1 FEET, SINUOSITY OF 1.3, AND 2:1 SIDE SLOPES.
6. TAILINGS/NATIVE ALLUVIUM INTERFACE ESTIMATED FROM BEST AVAILABLE DATA (EXISTING DRILLINGS / WELL LOGGING). INTERFACE MAY BE REVISED WITH ADDITIONAL FUTURE FIELD DATA.
7. ROCK SLOPE ARMORING ON FLOODPLAIN BACKSLOPE IS ANTICIPATED AT ALL LOCATIONS WHERE TAILINGS ARE PRESENT. ROCK ARMORING SHALL EXTEND UP TO THE 100-YEAR WATER SURFACE ELEVATION.
8. RIPARIAN REVEGETATION IS EXPECTED TO CONSIST OF PLANTING AND SEEDING NATIVE SPECIES THROUGHOUT THE PROPOSED FLOODPLAIN
9. UPLAND PLANTING AND SEEDING IS ANTICIPATED FOR ALL DISTURBED SLOPES. SLOPES MAY REQUIRE MULCHING AND/OR TACKIFIER.
10. THE REMAINING PORTION OF THE EXISTING CONCRETE CHECK DAM STRUCTURE WILL BE REMOVED.



SECTION VIEW B-B'

20' 10' 0 20' 40'
SCALE: 1"=20'-0"



SECTION VIEW C-C'

10' 5' 0 10' 20'
SCALE: 1"=10'-0"

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C3

SHEET 3 OF 3